PREGNANCY ULTRASOUND

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OBJECTIVES

KNOW WHY AND WHEN ULTRASOUND USE IN PREGNANCY

PREGNANCY ULTRASOUND: Is the use of ultrasound scans in pregnancy

Since its introduction in the late 1950’s ultrasonography has become a very useful diagnostic tool in obstetrics

- Equipments are used in real time scanners (moving fetus can be depicted on a monitor screen)
- Frequency: 3.5 and 7.5 megahertz
- Transducer: is placed in contact with the maternal abdomen, and is moved to look at any content of the uterus

- The information obtained from different reflections are recomposed back into a picture on the monitor screen (sonogram, ultrasonogram)
- Measures: size, diameters, gestational age
- Full bladder is required when abdominal scanning in early pregnancy

A - Why and when is ultrasound used in pregnancy

Indispensable obstetric tool and play an important role in the care of every woman

Is considered to be safe, non-invasive, accurate and effective investigation of the fetus

First term

Second term

Third term

The main use of ultrasonography are the following areas

1 - Diagnosis and confirmation of early pregnancy

Gestational sac be visualized as four and half weeks of gestation, and yolk sac at about five weeks

US confirm the site of pregnancy

2 - Vaginal bleeding in early pregnancy

Viability of the fœtus can be documented in presence of vaginal bleeding in early pregnancy

heartbeat could be seen and detectable by pulse Doppler about 6 weeks (if this is observed , the probability of a continuing pregnancy is more than 95%

5% (missed abortion, blighted ovum)

Fetal heart rate tends to vary with gestational age:

6 weeks 90-110 beats per minute

9 weeks 140-170 beats per minute

5-8 weeks: a bradycardia less than 90 beats per minutes is associated with high risk of miscarriage

Many women dot not ovulate at around day 14, findings after a single scan should always be interpreted with caution; the diagnosis of missed abortion is usually made by serial US scans (lack of gestational development)

If US cannot demonstrate a clearcut heartbeat, it is reasonable to repeat the US in 7-10 days to avoid error

In the presence of first trimester bleeding, US is also indispensable in the early diagnosis of ectopic pregnancies and molar pregnancies

3 - Determination of gestational age and assessment of fetal size

- Fetal body measurements reflect the gestational age of the fetus (this is particularly true in early pregnancy)
- In patient with uncertain last menstrual period, measurements must be made as early as possible in pregnancy, to arrive at a correct dating for a patient

The following measurements are usually made

a) The crown-rump length (CRL)

7-13 weeks: gives the accurate estimation of gestational age

dating with the CRL can be within 3-4 days of the menstrual period

b) The biparietal diameter (BPD)

Is measured after 13 weeks between the 2 sides of the head

it increases from about 2.4 cm at 13 weeks to about 9.5 cm at term

NB: different babies of the same weight can have different head size

dating in the later part of pregnancy is generally considered unreliable

BPD should be done as early as is feasible

c) The femur length (FL)

it reflects the longitudinal growth of the fetus

it increases from about 1.5 cm at 14 weeks to about 7.8 cm at term

NB: Its usefulness is similar to the BPD

d) The abdominal circumference (AC)

Is the single most important measurement to make in late pregnancy

d) Weight of the fetus

Use of polynomial equations containing BPD, LF, AC

Computer software and charts are readily available

4 - Diagnosis of fetal malformation

First trimester:

- chromosomal abnormalities: absence of fetal nasal bone; increased fetal nuchal translucency (the areas at the back of the neck) to detect the Down syndrome fetuses

Before 20 weeks: hydrocephalus, anencephaly, myelomeningocoele, achondroplasia, spina bifida, gastroschisis, duodenal atresia, fetal hydrops, cleft lips/palate , cardiac abnormalities

US assists in other diagnosis procedures in prenatal diagnosis such as:

- amniocentesis
- chorionic villus sampling
- fetal therapy

5 - Placenta localization

Diagnosis or exclusion of placenta praevia

Others placenta abnomalities in conditions such as diabetes, fetal hydrops, IGR (RCI)

6 - Multiple pregnancies

number of fetuses, the chorionicity, fetal presentation

7 - Hydramnios and oligoamnios

In both these situations, careful US examination to be made to exclude:

- intra-uterine retardation
- congenital malformation (intestinal atresia, hydrops fetalis, renal dyplasia)

8 - Other areas

- confirmation of intra-uterine death
- confirmation of fetal presentation in uncertain cases
- evaluation of fetal movements, tone and breathing in the biophysical profile
- diagnosis of uterine and pelvic abnormalities during pregnancy: ovarian cyst, fibromyoma

TRANSVAGINAL SCANS

Probe is placed in the vagina of the patient

The method provides: better image and more information

the fetal heart can be clearly observed as early as 6 weeks of gestation

- Indispensable in the early diagnosis of ectopic pregnancies
- Increasing number of fetal abnormalities

DOPPLER US

Detection of fetal heart pulsation and

pulsation in various fetal blood vessels

IP, IR

FLOW VELOCITY

Diminished flow in diastolic phase of a pulse cycle is associated with compromise in the fetus

The blood vessels commonly involved include umbilical arteries, aorta, middle cerebral arteries, uterine arteries, inferior vena cava

3-D and 4-D US

3-D

The transducer takes a series of images, thin slices, of the subject, and the computer processes these images and presents them as a 3 dimensional image

A good 3-D image is often very impressive to the parents

Possibility of increasing psychological bonding between the parents and the baby

In case of malformation smaller defects may be more clearly demonstrated: spina bifida, cleft lips/palate, polydactyly, facial dysmorphia, clubbing of foot, low set ears

The ability to obtain a good 3-D picture is nevertheless still very much dependent on operator skill, the amount of amniotic fluid around the fetus, its position, degree of maternal obesity, movement of fetus, so that a good image is not always readily obtainable

4-D or dynamic 3-D US

- Look at the face and movement of your baby

THE SCHEDULE

Number of US scans during pregnancy

Generally at

- 5- 7 weeks to confirm pregnancy
- 11-14 weeks to measure nuchal translucency, to evaluate nasal bone, and to detect tricuspid regurgitation
- 18-20 weeks to look for congenital malformations, placenta position

32 weeks :placenta position is further verified; fetal growth retardation (use of Doppler)

NB: should never interpret a normal scan report as a guarantee that the baby will be completely normal


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?4G?4
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6S4J


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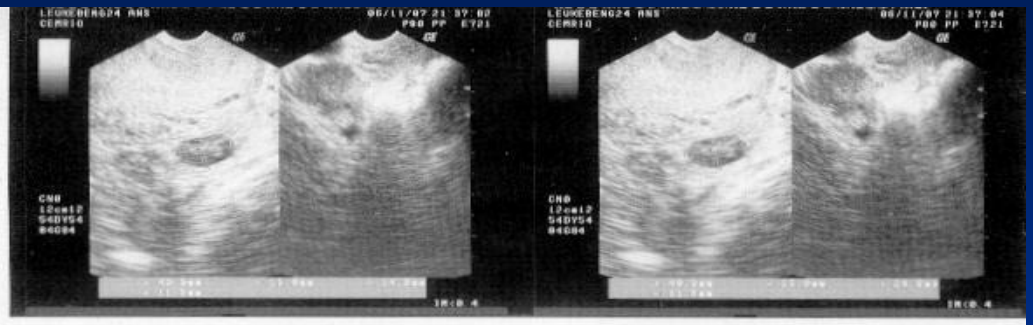


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